

No. 827,218

PATENTED JULY 31, 1906.

A. DE VOS.
ELECTRICALLY WOUND CLOCK.
APPLICATION FILED JUNE 30, 1904.

2 SHEETS—SHEET 1

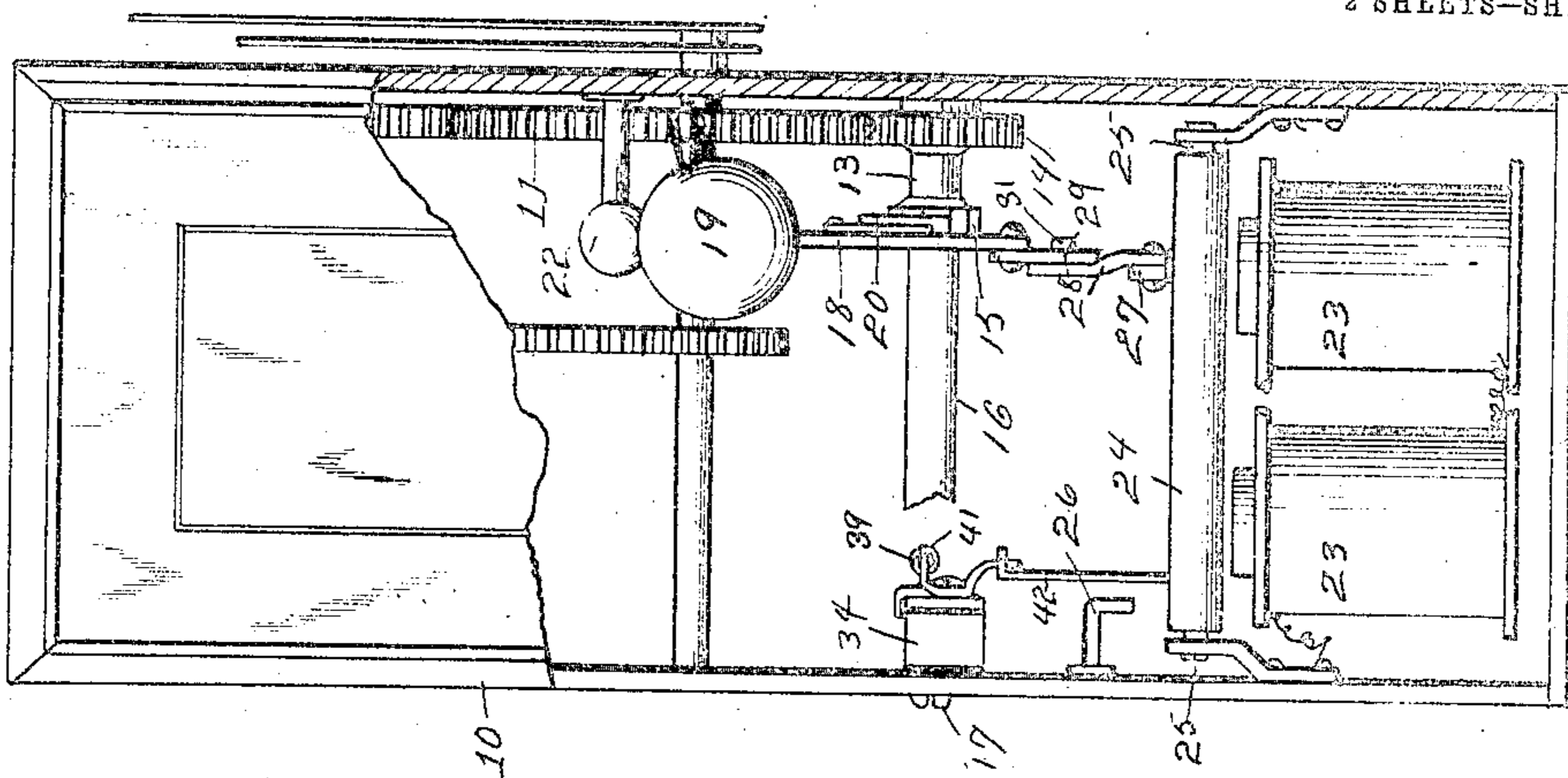


Fig. 2.

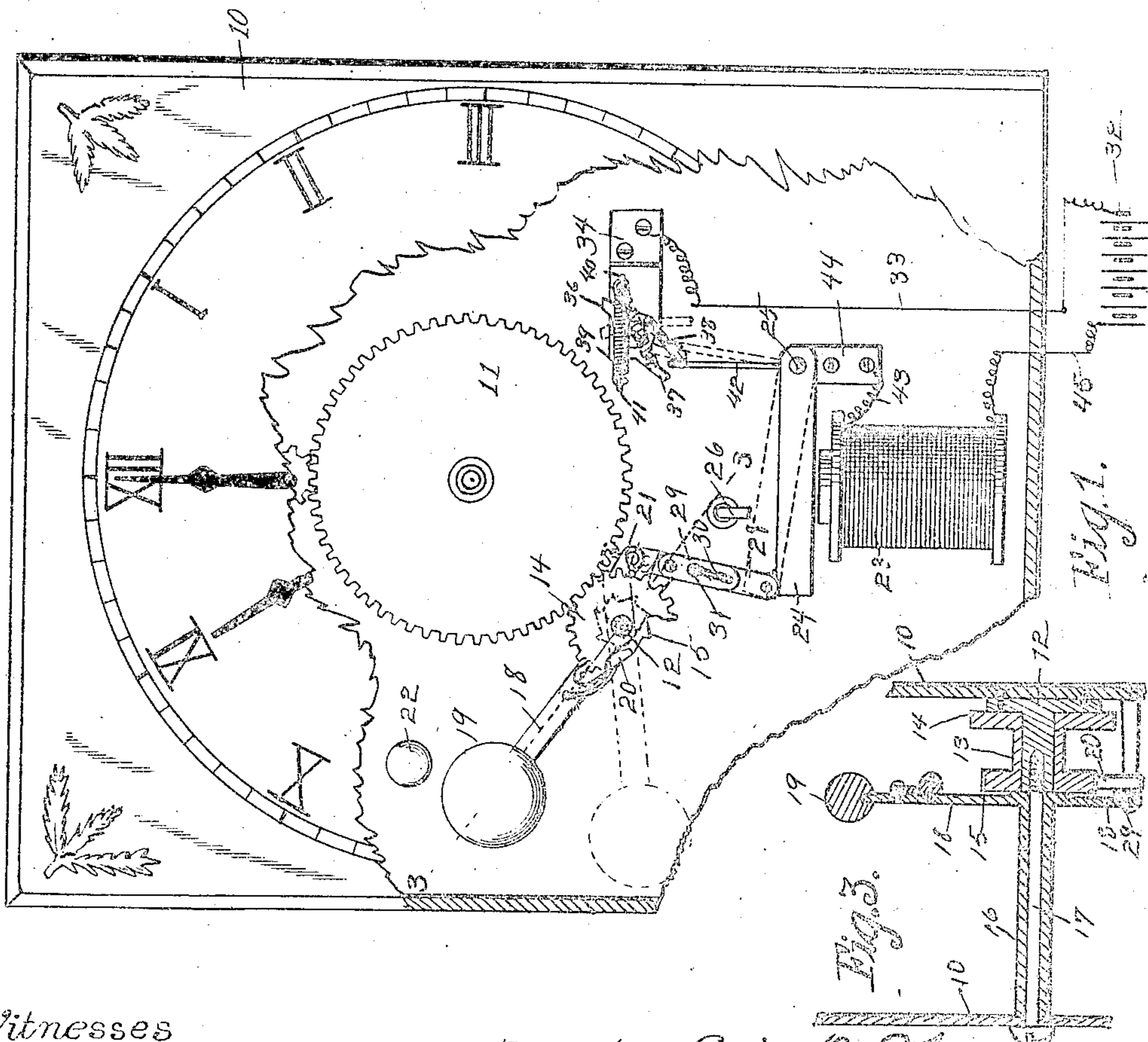


Fig. 1.

Fig. 3.

Witnesses

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Inventor Arie de Vos.

By Irving Lane Atty

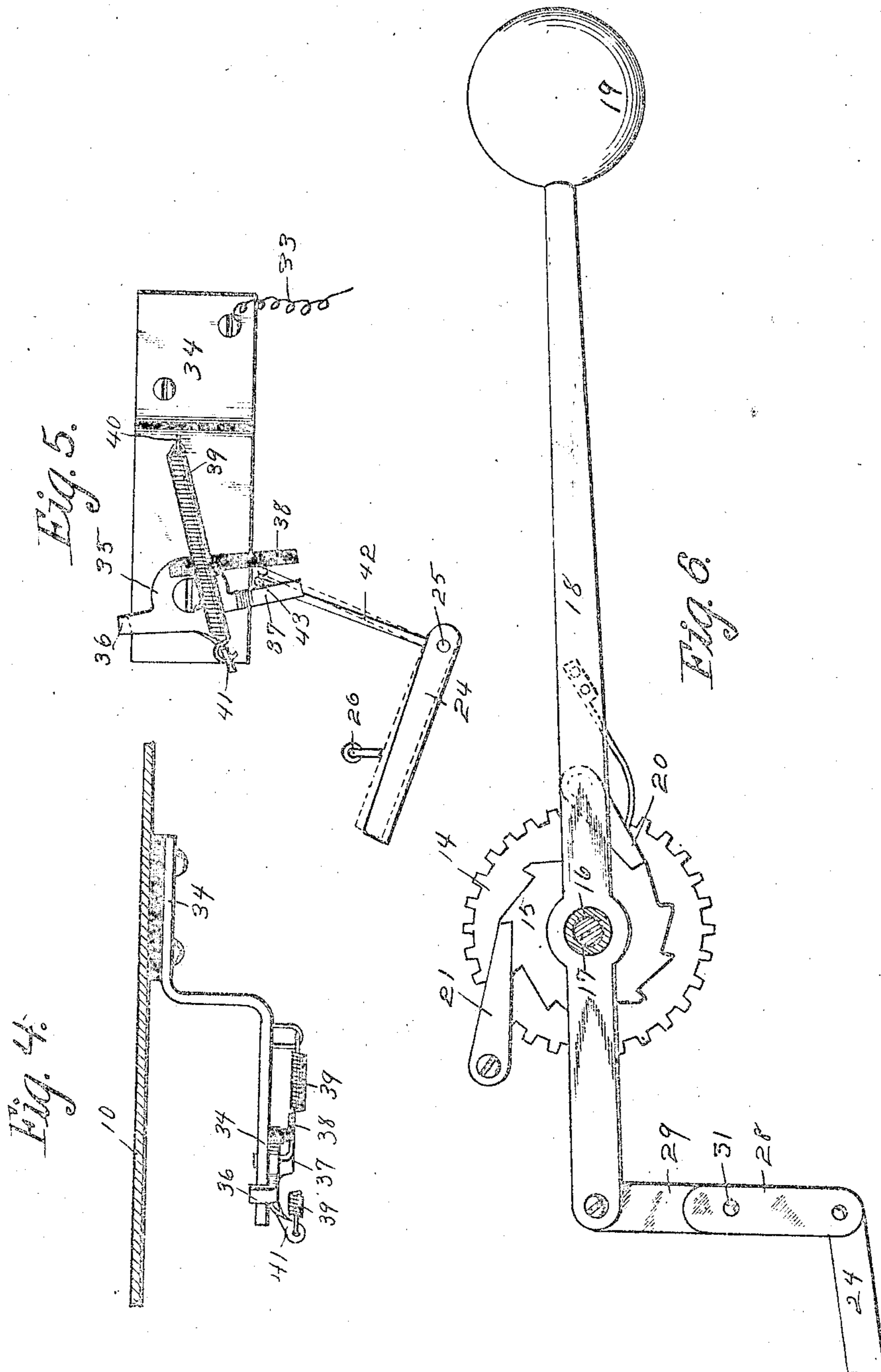
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J. B. Smutney

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By *Ernest Lane* Attys

UNITED STATES PATENT OFFICE.

ARIE DE VOS, OF DES MOINES, IOWA, ASSIGNOR OF ONE-HALF TO S. S. STILL, OF DES MOINES, IOWA.

ELECTRICALLY-WOUND CLOCK.

No. 827,218.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed June 30, 1904. Serial No. 214,728.

To all whom it may concern:

Be it known that I, ARIE DE VOS, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Electrically-Wound Clock, of which the following is a specification.

The objects of my invention are to provide a clock of this class of simple, durable, and inexpensive construction.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which—

Figure 1 shows a front elevation of a portion of a clock with my improved electrical winding device in position therein. The dotted lines indicate the position of the parts with the armature away from the magnet. Fig. 2 shows a side elevation of same with part of the clock-frame broken away. Fig. 3 shows an enlarged detail sectional view of the weighted lever and connected parts on line 3 of Fig. 1. Fig. 4 shows a detail top view of the automatic circuit-breaker. Fig. 5 shows a detail side view of the same with the parts in position for establishing a circuit. The dotted lines show the armature moved to position passing the point where a circuit is established. Fig. 6 shows a detail side view of the weighted lever and connected parts.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate that part of the clock-frame shown.

The numeral 11 indicates one of a train of pinions constituting the clockwork mechanism. It is to be understood that any ordinary clockwork mechanism may be used in connection with my improved electrical winding mechanism. Hence it is not necessary to show and describe any specific kind of clockwork.

The means for winding the clockwork mechanism comprises a short arbor 12, secured to the front of the clock-frame to support a hub 13, which is rotatably mounted thereon and which is formed with a pinion 14, in mesh with the pinion 11 of the train of pinions, and a ratchet-wheel 15.

The numeral 16 indicates a hub rotatably

mounted upon the screw 17, which is passed through the rear of the clock-frame and which is seated in the arbor. Formed on the hub 16 is a lever 18, provided at one end with a weight 19. Mounted on the lever 18 is a spring-actuated pawl 20 to engage the ratchet-wheel 15, and pivoted to the clock-frame adjacent to the ratchet-wheel 15 is a gravity-pawl 21. These pawls operate as follows: When the weighted end of the lever 18 moves downwardly, the spring-actuated pawl 20 rotates the ratchet-wheel 15, the other pawl dropping from one notch to the other and preventing the ratchet-wheel 15 from moving backwardly. Then when the weighted end of the lever moves upwardly the pawl 21 holds the ratchet-wheel 15 against rotation and the pawl 20 moves from one notch to the other thereof. The numeral 22 indicates a stop fixed to the front of the clock-frame to limit the upward movement of the weighted lever.

The weighted lever is operated as follows: The numeral 23 indicates an electromagnet mounted in the clock-frame, and 24 indicates an armature pivoted at 25 to swing from a position in engagement with the armature upwardly to a stop 26, which limits its upward movement. Fixed to the armature 24 is a lug 27, to which a link 28 is pivoted. 29 indicates a link pivoted to the weighted lever 18 and provided with a slot 30, through which a screw 31 is passed, which screw is seated in the upper end of the link 28, thus providing a sliding connection between the links 28 and 29. When the armature is moved toward its magnet, the weighted end of the lever is elevated, and then when the magnet no longer attracts the armature the weighted end of the lever slowly descends and rotates the pinion 14, which winds the train of pinions of the clock. When the armature is drawn toward its magnet it moves with great speed, and since the screw 31 is at the bottom of the slot 30 the weighted lever is thrown upwardly with considerable force, and its momentum carries it farther than it would go if there were no sliding connection between the armature and weighted lever. Hence the pawl 20 passes over a number of the teeth and the weighted lever held by the pawl at the highest point it reaches, thus actuating the clockwork mechanism for a

longer time than if its upward movement were limited by the movement of the armature.

I have provided means for automatically closing an electric circuit through the electromagnet just before the weighted end of the lever reaches its lower limit of movement as follows: The numeral 32 indicates the battery, and 33 indicates a conductor leading from the battery to a metal bracket 34. Pivoted to the bracket 34 is a circuit-breaker 35, having an arm 36 engaging the top of the bracket to limit the pivotal movement of the circuit-breaker in both directions. Extending downwardly from the circuit-breaker 35 is a metal arm 37, and adjacent to it is an arm 38, made of a non-conductor of electricity. The numeral 39 indicates a contractible coil-spring connected at 40 with the bracket 34, passed across the pivotal point of the circuit-breaker 35 and attached to an arm 41 on the circuit-breaker. By means of the spring the circuit-breaker is automatically moved to its limit in both directions when the arm 41 thereof has passed a point in alinement from the point 40 through the pivotal center of the circuit-breaker. Fixed to the armature 24 is an arm 42, having a projection on its upper end projecting between the arms 37 and 38 of the circuit-breaker. A conductor 43 leads from the bracket 44 of the armature to the electromagnet, and a conductor 45 leads from the electromagnet to the battery 32. In the practical operation of this part of the device and assuming the circuit-breaker to be in the position shown in solid lines in Fig. 1, the spring 39 is above the pivotal center of the circuit-breaker and yieldingly holds the insulated arm 38 of the circuit-breaker against the arm 42 of the armature. As the armature moves upwardly it forces the arm 38 of the circuit-breaker with it until the spring 39 passes below the center of the circuit-breaker. Then the spring quickly throws the circuit-breaker to position, with the arm 37 thereof in contact with the arm 42, thus establishing a circuit through the electromagnet. The position of the circuit-breaker as required to establish a circuit is shown in Fig. 5. In this connection it is to be noted that if for any reason the electromagnet should fail to attract the armature when the arm 37 thereof first strikes the arm 42 of the armature then the arm 42 continues to move away from the arm 37 to position out of contact therewith, as clearly shown by dotted lines in Fig. 5. The advantage of this feature is that if for any reason the armature should fail to move

toward the magnet when a circuit is established then the weighted lever will continue the upward movement of the armature until the circuit is broken, thus preventing the batteries from running down if the mechanism should stop at this point.

In practical use and assuming the weight to be at its upper limit of movement the circuit-breaker is held in position with its insulated arm 38 in engagement with the arm 42. Then as the weighted lever slowly descends it operates the clockwork mechanism and elevates the armature. When the armature is near its upper limit of movement, the spring 39 quickly draws the circuit-breaker to position with the arm 42 thus establishing a circuit. As soon as a circuit is established the armature is attracted toward its magnet, thus causing the arm 42 to push against the arm 37 of the circuit-breaker and move it to position with the spring 39 above the center of the circuit-breaker, thus causing the spring to throw the circuit-breaker to one limit of its movement, with its insulated arm 38 in engagement with the arm 42, and at the same time elevating the weight.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

The combination of a clockwork mechanism, an electric circuit, an electromagnet included in the circuit, a movable armature for the magnet, a yielding pressure device arranged to have power stored in it by the movement of the armature toward the magnet and also arranged to operate the clockwork mechanism by its own power, a contact-point movable by the armature and included in the circuit, a second contact-point in the circuit to be engaged by the first, a contact-arm attached to the armature and included in the circuit, a second pivoted contact-arm included in the circuit and in position to be engaged by the first as the armature approaches its limit of movement away from the magnet, and a limiting device arranged to stop the pivoted contact-arm before the armature reaches its limit of movement away from the magnet to permit said contact-arm on the armature to pass out of engagement with the pivoted contact-arm at the end of its movement away from the armature, in the event that the magnet should fail to attract the armature.

ARIE DE VOS.

Witnesses:

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